fluorocarbon gas having the lower ratio of carbon atoms to fluorine atoms forming at least one half of the mixed gas; and

etching a connection hole through said electrically insulating layer in a single etching step to said electrically conducting layer using [a] only said mixed gas as the etchant [of multiple types of fluorocarbon gases that have different ratios of carbon atoms to fluorine atoms (hereafter called C/F ratio)].

Cancel claim 2 without prejudice.

Amend claim 3 as follows:

3. (Twice Amended) A [S]semiconductor device manufacturing method as described in Claim [2] 1 wherein C_4F_8 is used as the [first] fluorocarbon gas having a lower ratio of carbon atoms to fluorine atoms and at least one selected from the group composed of CHF_3, CH_2F_2, and CF_4 is used as the [second] fluorocarbon gas having a higher ratio of carbon atoms to fluorine atoms.

Amend claim 4 as follows:

4. (Twice Amended) A [S]semiconductor device manufacturing method described in Claim 1 wherein the insulating layer is plasma-etched with the mixed gas of fluorocarbon gases.

Amend claim 5 as follows:

5. (Twice Amended) A [S]semiconductor device manufacturing method [device] described in Claim 1 [wherein a lower conducting layer is formed on the semiconductor substrate as an electrode or wiring, a connection hole is formed by etching the insulating layer that covers the lower conducting layer, and] further including an upper electrically conducting layer

connected to the lower electrically conducting layer [is] formed in the connection hole as an electrode or wiring.

Amend claim 6 as follows:

6. (Twice Amended) A [S]semiconductor device manufacturing method described in Claim 5 wherein the lower electrically conducting layer has a titanium nitride layer on the surface where the connection hole is formed and the electrically insulating layer includes a spin-on glass layer.

Amend claim 7 as follows:

7. (Twice Amended) A [S]semiconductor device manufacturing method described in Claim 6 wherein the lower electrically conducting layer is made of a stacked structure having a titanium nitride layer, a layer of aluminum or an alloy thereof, a titanium layer, and a titanium nitride layer stacked in that order, and the electrically insulating is made of a stacked structure having a silicon oxide layer formed from tetraethyl[/]orthosilicate, a spin-on glass layer, and a silicon oxide layer formed from tetraethyl[/]orthosilicate stacked in that order.

REMARKS

Claims 1 and 3 to 7 have been amended and claim 2 has been cancelled without prejudice. Accordingly, claims 1 and 3 to 7 are now active in this application.

The objection to claim 1 is believed to be overcome by the amendment to that claim.

Claims 1 to 4 were rejected under 35 U.S.C. 102(b) as being anticipated by Arleo (U.S. 5,176,790). The rejection is respectfully traversed.

Claim 1 requires, among other steps, the step of providing a gas etchant comprising a mixed gas of multiple different fluorocarbon gases, each fluorocarbon gas having a different